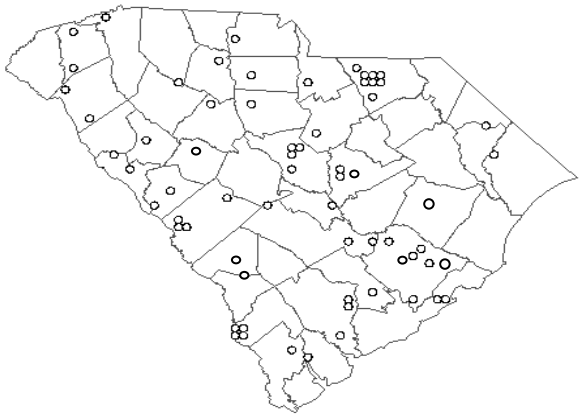
2019 Bobwhite Quail Whistling Cock Census

The Bobwhite Quail (*Colinus virginianus*) Whistling Cock Census was conducted for the 41th consecutive year in 2019. Seventy-two routes were sampled in 2019, resulting in sixty-five routes which yielded data comparable to the previous year. Approximate locations of survey routes are shown in Figure 1.

Figure 1. South Carolina Bobwhite Quail Whistling Cock Census route locations - 1979 - 2019.



Methods

Census routes are sampled between 15 June and 10 July, believed to be the period of maximum bobwhite whistling in the Southeast (Rosene 1969). Each route consists of 12 stops at 1/2 mile intervals. Exactly 8 minutes are allotted for listening at each stop, beginning at official sunrise. The number of calling males is recorded at each stop and totaled for the entire route. Route totals are used for trend comparisons. Weather conditions are also recorded, and operation of routes is discouraged on rainy or windy days. Based on an extensive analysis of historical Whistling Cock Census data, the survey protocol was changed in 2003 from a two-day survey to a one-day survey. The afternoon listening period was also eliminated as an option in the survey protocol.

As in previous years, data were analyzed using a paired *t*-test for equal sample sizes (Steel and Torrie 1980). Between-year comparisons were conducted using all routes that were run in both 2018 and 2019. The 2019 mean was also compared with the long-term average using a paired *t*-test.

Results and Discussion

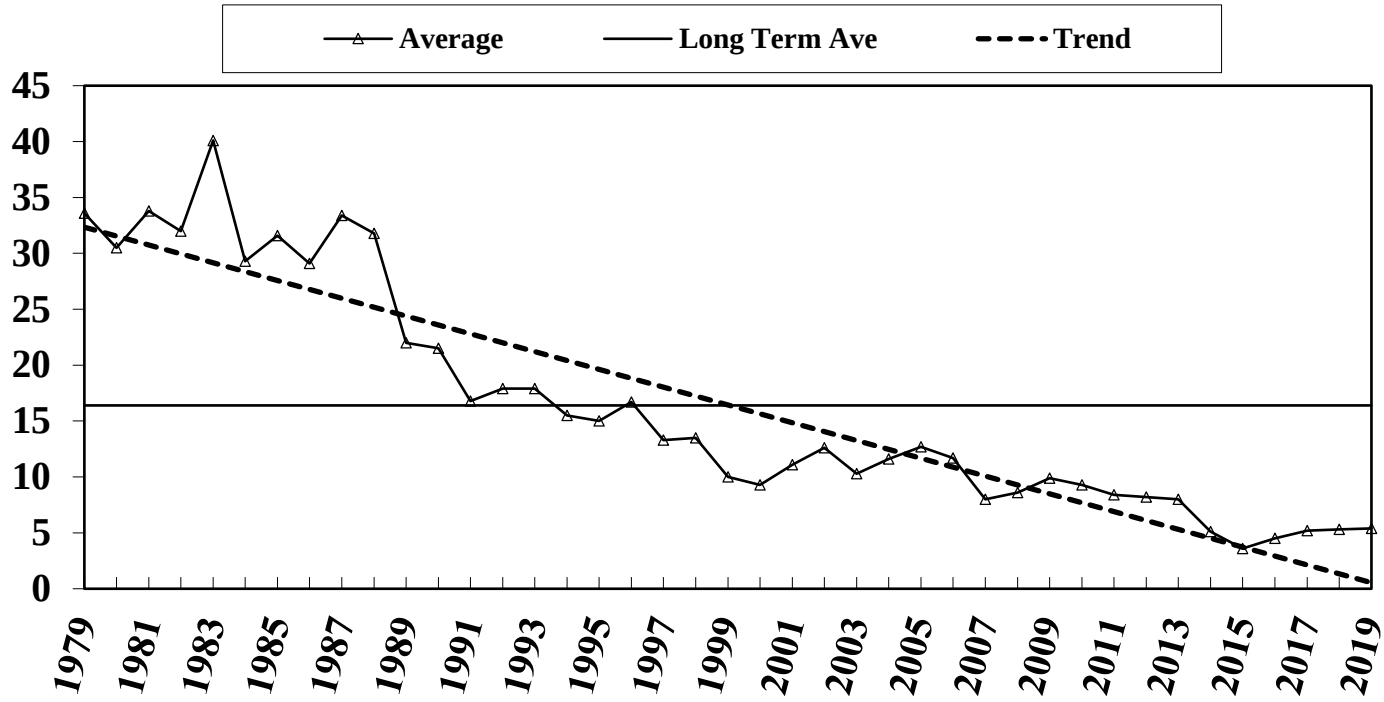
Approximately fifty-three observers surveyed 72 routes in 2019. Sixty-five of these routes were used in year-to-year comparisons. A total of 356 whistling cocks were recorded on the 65 routes for an average of 5.5 (SE = 0.98) birds/route. For all routes sampled, a total of 387 whistling cocks were recorded with an average number of calling birds of 5.4 (SE = 0.90) birds/route (Table 1).

The 2019 mean call count index did not significantly differ ($P > 0.05$) from the 2018 index. The 2019 index was significantly less than ($P < 0.01$) the long-term average for the 41 years of the census (16.4 birds/route, N=2015, Fig. 2).

Table 1. Summary of South Carolina Bobwhite Quail Whistling Cock Census, 1979-2019.

Year	Number of Routes	Calling Males/Route (Average)
1979	18	33.6
1980	19	30.5
1981	26	33.8
1982	28	32.0
1983	27	40.1
1984	28	29.3
1985	28	31.6
1986	30	29.1
1987	28	33.4
1988	28	31.8
1989	38	22.0
1990	39	21.5
1991	40	16.8
1992	43	17.9
1993	44	17.9
1994	47	15.5
1995	51	15.0
1996	53	16.7
1997	52	13.3
1998	53	13.5
1999	56	10.0
2000	57	9.3
2001	56	11.1
2002	59	12.6
2003	60	10.3
2004	61	11.6
2005	61	12.7
2006	62	11.7
2007	63	8.0
2008	63	8.6
2009	66	9.9
2010	67	9.3
2011	68	8.4
2012	64	8.2
2013	62	8.0
2014	47	5.1
2015	59	3.6
2016	63	4.5
2017	62	5.2
2018	69	5.3
2019	72	5.4
41-year average	**49.2**	**16.4**

Figure 2: Average Bobwhite Quail Whistling Cock Census call count (birds/route) in South Carolina 1979-2019, trend and long-term average for the period.



Quail call counts in 2019 were higher on 27 routes (42 %) and lower on 26 routes (40 %) compared to 2018. Statewide, there was 46 more birds recorded in 2019 than was heard on the same routes in 2018, an increase of 14.8 % percent.

Because of natural mortality, breeding populations of quail are never high relative to early fall populations. Extreme weather conditions during the nesting season and land-use changes can further depress quail numbers.

Whistling Cock Survey data are used in conjunction with Quail Brood Survey data, Quail Hunter Survey data, and Fall Covey Count data to assess the population status of quail statewide as well as the effects of land use change and other factors, such as weather, on the statewide quail population.

Land-use changes surrounding routes is the most difficult variable to qualify. When routes for the Whistling Cock Census were established in 1979, cooperators were instructed to locate census lines in areas where good quail populations existed. Routes are not moved to new locations unless access is limited or noise disturbance (e.g., road traffic) makes counting calling birds impossible. Many routes which were established through mixed forest and farmlands are now surrounded by pine plantations. Therefore, a dramatic decrease in the suitability of the

habitat surrounding survey routes is thought to have severely depressed the numbers of calling birds on many routes. While large-scale (e.g. state level) habitat changes are obvious and are easily documented, it is much more difficult to quantify habitat changes at the call count route or point level. Analysis of fine-scale habitat components along survey routes should be conducted to validate the effects of habitat change on local quail populations.

Beginning in 2005 the US Forest Service established two and a half new survey routes in order to monitor the effects of bobwhite friendly forest management practices on bobwhite populations. These routes have been monitored continuously since inception. Last year the two full routes were included in the analysis of this report to fully represent all the data that is collected on a yearly basis. The half of a route was not included as it represents an incomplete data set. The half of a route will be evaluated to see if an additional 6 stops can be added to make the route a full route in order to be included in the annual analysis.

It is important to note that the full complement of routes were established to document year-to-year and long-term population changes. Thus, populations are expected to decrease for a period of time and should rebound if the habitat reverts to a more suitable type.

The Bobwhite Quail Whistling Cock Census should be continued in order to monitor changes in habitat conditions and the resultant quail population response. Additional routes are needed in areas of low route density to increase the precision of the survey and to provide more complete statewide coverage.

Literature Cited

Rosene, W., Jr. 1969. The Bobwhite Quail: Its life and management. Rutgers University Press, New Brunswick, N. J. 418 pp.

Steel, R. G. D. and J. H. Torrie. 1980. Principles and procedures of statistics: A biometrical approach. McGraw Hill Book Company, New York. 633 pp.